

Redfish

OCTOBER, 2012 (ISSUE #16)



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MARINE



Goldsaddle Goatfish Factfile

BLOG



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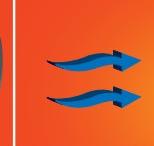
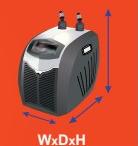
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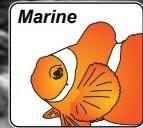
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Email: enquiries@redfishmagazine.com.au
Web: redfishmagazine.com.au
Facebook: facebook.com/redfishmagazine
Twitter: [@redfishmagazine](https://twitter.com/@redfishmagazine)

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The advice contained in this publication is general in nature and has been prepared without understanding your personal situation, experience, setup, livestock and/or environmental conditions.

This general advice is not a substitute for, or equivalent of, advice from a professional aquarist, aquarium retailer or veterinarian.

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About Redfish

Redfish is a free-to-read magazine for fishkeeping enthusiasts.

At Redfish we believe in the free exchange of information to facilitate success by aquarium and pond hobbyists. Each month Redfish Magazine will bring you dedicated sections on tropical, coldwater, marine and ponds.

Redfish was founded in early 2011 by Jessica Drake, Nicole Sawyer, Julian Corlet and David Midgley.

We hope you enjoy this, the 16th issue of Redfish.

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ふるいけやかわづとびこむみずのおと

OFF THE SHELF

Aqua One Nautilus Canister Filters

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Protomelias spilonotus - Photo Brian Gratwicke

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Cichlids Explored

INFORMATION FOR NEW CICHLIDOPHILES FROM AN OLD CICHLIDOPHILE.

I have been asked this question many times by friends and family and the reasons are multiple. I think the most attractive aspect of cichlidophily is their brood care. When I first bred a pair of kribensis (*Pelvicachromis pulcher*) in a 80L tank in my bedroom I knew I was hooked. Just watching the parents care for the eggs and in time herd their small school of fry around the tank, all the time fending off attacks from other community species, is enough to intrigue anyone. Most people begin their cichlid keeping hobby by buying a single cichlid or a pair of cichlids such as angelfish, kribensis or blue rams for their community aquarium. In a community setting it rapidly becomes apparent that the cichlids are more intelligent than most of the other community species. They are first to feed and often show complex behaviours such as displaying to each other in elaborate rituals or defending their territory (often the whole tank) from any reflections in glass.

Recently I visited a small aquarium in Chatswood in Sydney's northern suburbs and asked about cichlids in stock, I was told by a helpful sales assistant that they "...did not stock cichlids, as they are too big and aggressive..." A quick look at their tanks indicated this wasn't quite the truth, they didn't stock any cichlids other than: oscars, jewelfish, discus, angelfish, Bolivian and blue rams, kribensis some humphead acaras. This illustrates a couple of commonly held myths about cichlids, firstly the sales assistant believed the term "cichlids" referred only to the cichlid fishes of the eastern African rift lakes and secondly that all cichlids are aggressive.

Cichlids are representative of a large family of fishes with approximately 1700 member species, the cichlids that are commonly available in the aquarium are from Central and South America, Asia, Madagascar and tropical Africa. For the novice hobbyist it is easiest to divide these fishes into a number of geographical groups for keeping in aquaria. While mixing cichlids from different regions is possible, it should only really be done by people with experience keeping cichlids.

This article will give you a taste of the major groups. There is, however, an enormous amount of diversity in this family. Whether you're looking to setup a community tank or a species aquarium for breeding - there's likely to be a cichlid that suits your setup. They are, however, a group that requires some research before purchase as the requirements and behaviour of one species does not necessarily translate uniformly across the group.



The Oscar (*Astronotus ocellatus*) is a large growing, but comparatively peaceful fish. It will eat smaller fishes but is regarded fondly by many hobbyists for its intelligence.



A member of the 'Hap' group of Lake Malawi cichlids, this *Nimbochromis fuscotaeniatus* shows some of the striking colours available within the cichlid family.



Gentle, brightly coloured and fascinating. There's a reason that Kribensis (*Pelvicachromis pulcher*) are so popular with aquarists. This is a male, the lesser coloured individual of the two sexes.

Large Central American Cichlids

Commonly available genera include:

Amatitlania (eg: *A. nigrofasciatus* - Convict cichlid), *Amphilophus* (eg: *A. citrinellum* - Red Devil), *Hypsophrys* (eg: *C. nicaraguense* - Parrot cichlid), *Herichthys* (eg: *H. carpinitis* - Blue Texas Cichlid), *Nandopsis* (eg: *N. octofasciatus* - Jack Dempsey), *Neetroplus* (eg: *N. nematopus*), *Parachromis* (eg: *P. managuense* - Jaguar Cichlid), *Thorichthys* (eg: *T. meeki* - Firemouth Cichlid), *Vieja* (eg: *V. synspilus* - Synspilum or Quetzal).

GENERA	SIZE	AGGRESSION	SEX RATIO	BREEDING METHOD	DIET
<i>Amatitlania</i>	Small/Medium	less aggressive to aggressive	1:1	Switch (Open/Cave) spawn	Omnivore
<i>Amphilophus</i>	Medium/Large	very aggressive	1:1	Open spawn	Omnivore
<i>Herichthys</i>	Medium/Large	aggressive	1:1	Open spawn	Omnivore
<i>Nandopsis</i>	Medium/Large	aggressive to very aggressive	1:1	Open spawn	Omnivore
<i>Neetroplus</i>	Small/Medium	aggressive to very aggressive	1:1	Cave spawn	Supplement with plant material
<i>Parachromis</i>	Large/Very Large	aggressive to very aggressive	1:1	Open spawn	Omnivore
<i>Rocio</i>	Medium	less aggressive to aggressive	1:1	Open spawner	Omnivore
<i>Thorichthys</i>	Small/Medium	less aggressive	1:1	Open spawn	Omnivore
<i>Vieja</i>	Large	less aggressive to aggressive	1:1	Open spawn	Supplement with plant material

These fish thrive in neutral to slightly alkaline water which can range in pH from around 7.0 to 7.5. The smaller genera (*Thorichthys* and *Amatitlania*, for example) can be kept in 100L tanks. When keeping the larger central cichlids one must consider a few factors, a tank size of 200L tank is enough to house only two (a pair) of the larger species such as *Vieja synspilus* or *Parapetenia managuense*. In cramped quarters such as these aggression is often heightened and the aquarist should have a divider on hand should the female need to be separated. For mixed large central American communities a tank size of 700L must be considered the minimum. Smaller central American cichlids such as *Thorichthys* or *Neetroplus* spp. may be housed in smaller tanks down to a minimum of 80L. Secondly a large effective power filter is essential when keeping these fish as they eat a lot and create large amounts of waste. Just a quick note on filtration it is useful, particularly with larger cichlids, to practice "More's law". It is impossible to have water that is over filtered so get more filtration than needed when buying a filter.



Named for its relatively pugnacious nature, the Jack Dempsey, is a largely forgotten treasure from this group. Rarely kept, even more rarely bred. Individual colouring typically improves with age.

These beautiful cichlids are surely due a renaissance.

LARGE AMERICAN CICHLID COMPANION FISH

For the larger cichlids both tin foil barbs and silver dollars grow to a suitable size. For scavengers plecostomus catfish are excellent as their armor protects them from the attentions of a territorial cichlid. Other catfish include two Australian native species firstly *Tandanus tandanus*, the Dewfish, and the smaller Eel Tailed Catfishes (both family Plotosidae) do well, however as with any catfishes in such a tank, ample cover is necessary to hide them from the prowling cichlids attention.



Firemouth cichlids are another Central American gem. They are harder to breed than Convicts (below) but this is a good thing, as in some senses Convicts are a little fertile for many aquarists. Photo by Budi Lukman.



a little maligned, most of the bad press around the Convict cichlid stems from incidents where it is mixed with the wrong species invariably with bad results, for which the Convicts get the blame. Photo by Budi Lukman.

PLANTS FOR LARGE AMERICAN CICHLIDS

It is difficult to keep plants with these larger cichlids - some of the tougher plants are worth a go. In particular Java fern (*Microsorium pteropus*) or *Anubias* sp. are effective but be sure to weight the plants down with larger pebbles to prevent the cichlids dislodging them. Personally I dislike plastic plants but they can look effective if mixed with real plants. I would use a lot of rockwork and some large pieces of wood - avoid plants and the hassles associated with them in large central American cichlid communities.



Geophagine cichlids are notable not for their bright base colours, but for their iridescent scales which shine brightly under good lighting. As a bonus, most geophagine cichlids are peaceful aquarium residents - and relatively large individuals can be kept with modestly smaller fishes without fear of the smaller fish becoming prey. It is important to provide a fine substrate so they can indulge in their favourite feeding style "earth eating". This is a juvenile *Gymnogeophagus meridionalis*.

South American Cichlids

In the hobby this group is typically divided and the "Dwarf Cichlids" are carved off into a group of their own. I've replicated this division in the tables below - but it's not a division that's supported by taxonomy (or sometimes even behaviour), it's simply about size and the consequences of being either large or small. For example, *Geophagus* spp. are clearly large -- but behave mostly more like dwarf cichlids than some other larger South American cichlids.

LARGER SOUTH AMERICAN CICHLIDS

Commonly available genera include:

Aequidens (eg: *A. pulcher* - Blue Acara), *Astronotus* (eg: *A. ocellatus* - Oscar), *Cichla* (eg: *C. monoculus*), *Cichlasoma* (eg: *C. portalegrense* - Port Acara), *Geophagus* (eg: *G. surinamensis*), *Guianacara* (eg: *G. geayi* - Bandit Cichlid) *Gymnogeophagus* (eg: *G. balzani*), *Heros* (eg: *H. severus* - Severum), *Hypselecara* (eg: *H. temporalis* - Chocolate cichlid), *Mesonauta* (eg: *M. festivus* - flag acara), *Pterophyllum* (eg: *P. scalare* - Angelfish) *Satanoperca* (eg: *S. jurupari*), *Symphysodon* (eg: *S. discus* - Discus) *Uaru* (eg: *U. amphiacanthoides* - Uaru).

GENERA	SIZE	AGGRESSION	SEX RATIO	BREEDING METHOD	DIET
<i>Aequidens</i>	Small to Large	less aggressive to aggressive	1:1	Open spawner	Omnivore
<i>Astronotus</i>	Large	aggressive	1:1	Open spawner	Omnivore Opportunistic piscivore
<i>Cichla</i>	Very Large	less aggressive to aggressive	1:1	Open spawner	Specialised predator
<i>Cichlasoma</i>	Medium	less aggressive	1:1	Open spawner	Omnivore
<i>Geophagus</i>	Medium to Large	unaggressive to less aggressive	Species specific	Species specific	Omnivore Substrate sifter
<i>Guianacara</i>	Small to Medium	unaggressive to less aggressive	1:1	Open spawner	Omnivore
<i>Gymnogeophagus</i>	Medium to Large	unaggressive to less aggressive	1:3	Some mouthbrooding. Species specific.	Omnivore Substrate sifter
<i>Heros</i>	Medium to Large	less aggressive to aggressive	1:1	Open spawner	Supplement with plant material
<i>Hypselecara</i>	Medium to Large	unaggressive to less aggressive	1:1	Open spawner	Supplement with plant material
<i>Mesonauta</i>	Small to Medium	unaggressive to less aggressive	1:1	Open spawner	Supplement with plant material
<i>Pterophyllum</i>	Small to Medium	unaggressive	1:1	Leaf spawner	Omnivore Micropredator
<i>Symphysodon</i>	Small to Medium	shy to unaggressive	1:1	Leaf spawner	Omnivore Micropredator

DWARF SOUTH AMERICAN CICHLIDS

Commonly available genera include:

Aistogramma sp. (eg. *A. cacatuoides* - the Cockatoo Cichlid), *Cleithracara* sp. (eg. *C. maronii* - the Keyhole Cichlid), *Dicrossus* sp. (eg. *D. filamentosus* - Checkerboard cichlids), *Laetacara* sp. (eg. *L. dorsigera* - the Red Breasted Cichlid), *Mikrogeophagus* sp. (eg. *M. ramirezi* - the Blue Ram), *Nannacara* sp. (eg. *N. anomala*).

GENERA	SIZE	AGGRESSION	SEX RATIO	BREEDING METHOD	DIET
<i>Aistogramma</i>	Small	unaggresive	Varies.	Cave spawner	Omnivore
<i>Cleithracara</i>	Medium	unaggresive	1:1	Open spawner	Omnivore
<i>Dicrossus</i>	Small	unaggressive	1:1 (some harems)	Leaf spawner	Omnivore
<i>Laetacara</i>	Small to Medium	unaggressive	1:1	Open spawner	Omnivore
<i>Mikrogeophagus</i>	Small	unaggressive	1:1 (sometimes forms harems in larger tanks)	Open spawner	Omnivore
<i>Nannacara</i>	Small	unaggressive	1:1	Open spawner (sometimes spawns in cryptic locations)	Omnivore

With perhaps the exception of the cichlids of Lake Tanganyika, South American cichlids in general show the most varied patterns of reproduction along with the most highly developed brood care. Brood care appears to be most highly developed in monogamous cichlids, whether they be mouthbrooders or substrate spawners. The majority of larger South American species are monogamous open sp although some Geophagini and Heros species are polygamous mouthbrooders.

The genus *Aistogramma* contains a huge number of species most of which are polygamous breeders. In general South American cichlids tend to be more peaceful than their Central American cousins although some of the South American species (eg: Oscars) have a reputation for aggression. This aggression in South American cichlids is mostly due to limited tank size and when housed in large enough quarters most species are quite passive.

For the novice aquarist South American cichlids are perhaps the most difficult cichlids to keep correctly as they are an extremly variable group. Some genera, such as *Pteryophyllum*, *Symphysodon* and *Mesonauta* are particularly placid even shy and should all be kept in tall tanks with sufficient vegetation to provide cover for these fishes.

Tall plants, in particular *Vallisneria*, are favoured by these peaceful cichlids. In contrast to the peaceful nature of angel and discus-fish the larger *Aequidens* species, along with *Astronotus* species can be more aggressive and should not be kept in limited tank space or with any fish small enough to be considered a food item. Severums are less aggressive than oscars although far too aggressive to be kept with dwarf



Aistogramma species are beautiful fishes, they are, however, not straightforward to keep. Some species are prone to inexplicable illness and breeding can be challenging.



The Keyhole cichlid is larger than most dwarf cichlids , despite this it is a placid species that does well even with quite small hetero-specifics. Breeding the Keyhole is not without challenges, the shyness of the species means many spawns are abandoned unless sufficient cover is provided



Looking for all the world like a Central American cichlid, the Red Terror (or Guayas cichlid) is a stunning coloured, but aggressive cichlid from South America. Unusually the female is more brightly coloured than the male.



The beautiful Thread-Fin Acara is a lovely geophagine cichlid with long flowing fin filaments. Like many geophagine cichlids, the species has iridescent spots on its flanks. Large growing but peaceful the species is ideal for many aquariums but infrequently kept.

cichlids. They are best housed with more robust geophagines such as *G. brasiliensis*, chocolate cichlids (*Hypseleotris*) or the medium sized "acaras" such as "*Aequidens*" *puchleri*, *Krobia itanyi* or *Cichlasoma portalgrense*.

SUITABLE PLANTS AND COMPANION FISHES

GENERA	COMPANION FISHES	SUITABLE PLANTS
Dwarf cichlids, Angelfish, Discus or Mesonauta	Larger rasboras, tetras & corydoras catfish	All plant species are useful, particularly tall species.
Geophagines, "Acaras", Severums, Chocolate Cichlids (<i>Hypseleotris</i>)	Larger barbs (Spanner/Clown), botias & locariid catfish	Hardy plant species such as Java fern and Anubias, although severums and chocolate cichlids will place significant demands on the toughness of plant species used.
Oscars or larger acaras ("A. rivulatus")	Larger barbs, botias & larger locariid catfish	Only very hardy plant species useful, fish will uproot plants and plastic plants may provide a solution.

Lake Victoria and Lake Malawi Cichlids

COMMONLY AVAILABLE GENERA INCLUDE:

Astatotilapia (Syn: *Haplochromis*) (eg: *A. nyererei* - Flameback), *Aulonocara* (eg: *A. jacobfreibergi*), *Chilotilapia* (eg: *C. rhoadesi*), *Copadichromis* (eg: *C. quadrivittatus*), *Cyrtocara* (eg: *C. moorii* - Malawi Dolphin), *Dimidiochromis* (eg: *D. compressiceps* - Malawi Eye-biter), *Fossochromis* (eg: *F. rostratus*), *Labeotropheus* (eg: *L. fuelleborni*), *Labidochromis* (eg: *L. caeruleus* - Electric Yellow), *Maylandia* (eg: *M. lombardoi*), *Melanochromis* (eg: *M. johanni*), *Nimbochromis* (eg: *N. venustus*), *Otopharynx* (eg: *O. lithobates*), *Placidochromis* (eg: *P. electra*), *Protomelias* (*P. taeniolatus* - Red Empress), *Sciaenochromis* (eg: *S. ahli* - Electric blue), *Tyrannochromis* (eg: *T. macrostoma*).



A male *Maylandia lombardoi*. Malawi cichlids are strikingly sexually dimorphic, female *M. lombardoi* are sky blue with dark coloured stripes. Aggressive and requiring different water chemistry to the community tropicals, these African beauties should be kept in specialised African cichlid aquaria. Photo by Vlad Butsky.

Among the most spectacular of the East African cichlids, cichlids from Lake Malawi and Lake Victoria come in predominantly blue and yellow. They require a tank with a high pH 7.5-8.5 and high total hardness of around 10-17 dH. Barnacle shells, shell grit or crushed coral acts as a buffer to keep the pH and dH where it should be, specialised buffers also work well if you wish to avoid the use of carbonaceous rocks/substrate.

GENERA	SIZE	AGGRESSION	SEX RATIO	DIET
<i>Astatotilapia</i>	Medium	moderately aggressive	1:4	Omnivore
<i>Aulonocara</i>	Medium	less aggressive	1:3	Omnivore
<i>Chilotilapia</i>	Medium	less aggressive	1:3	Snail feeder Omnivore
<i>Copadichromis</i>	Medium to large	less aggressive	1:3	Omnivore
<i>Cyrtocara</i>	Medium to large	less aggressive	1:3	Omnivore
<i>Dimidichromis</i>	Medium to large	less aggressive to aggressive	1:3	Omnivore
<i>Fossochromis</i>	Large	less aggressive to aggressive	1:3	Omnivore
<i>Labeotropheus</i>	Small to medium	very aggressive	1:5	Algal grazer
<i>Labidochromis</i>	Small to medium	less aggressive to aggressive	1:3	Algal grazer
<i>Maylandia</i>	Small to medium	very aggressive	1:5	Algal grazer
<i>Nimbochromis</i>	Large	aggressive	1:3	Ambush predator Omnivore
<i>Otopharnx</i>	Medium	less aggressive	1:3	Omnivore
<i>Placidochromis</i>	Medium to large	less aggressive	1:3	Snail feeder Omnivore
<i>Protomelas</i>	Medium to large	less aggressive	1:3	Omnivore
<i>Sciaenochromis</i>	Medium to large	less aggressive	1:3	Omnivore
<i>Tyrannochromis</i>	Large	very aggressive	1:3	Ambush predator



The habitat of Lake Malawi recreated beautifully here by an aquarist. Note the absence of plants, the use of calcium carbonate based substrate and the relatively large pieces of stone. The cichlids in this photo are *Maylandia callainos* (the Cobalt Blue Zebra).
Photo by Lee Nachtigal.

Two groups of Lake Malawi cichlids have been artificially erected by many for purposes of aquarium keeping. The first group include the genera *Pseudotropheus*, *Melanochromis*, *Labidochromis* and *Labeochromis*. This group is often referred to as mbuna. Mbuna in the native tongue of the Malawi people literally means 'rockfish' and refers to the fact that these fish inhabit the rocky zone of the lake close to the shore. With space at a premium these fishes tend to be VERY aggressive and are best kept with other species from this group. Lake Victoria cichlids such as *Astatotilapia* sp. may be kept with the ultra-aggressive fishes from the aforementioned mbuna.

The second group of fishes include the less aggressive *Aulonocara* genera and other fish from related genera, these species live on the sandy zone, deeper in the lake, only returning to the fringes of the rocky zone for breeding. With less space restrictions the aggression between these species is far less. *Aulonocara* males have brilliant blues/yellows and oranges and are possibly the brightest of any freshwater fish.

Nimbochromines and the species in the genus *Tyrannochromis* are specialised ambush predators and as such should not be housed with smaller mbuna unless the small fish has many refuges in which to hide. Malawi cichlids are all quite closely related and interbreeding is common in community tanks. For breeding purposes all Lake Malawi/Victoria/Tanganjikan fishes should be kept in individual species tanks. If your cichlids do hybridise do not sell on the young.

A similar rule applies to keeping the Lake Malawi as to keeping the central and south American cousins. Buy the fish based on their adult size. Do not buy fishes that are much smaller than your largest fish, or chances are, that fish will make the next meal. The armored Locaridaceae catfishes make efficient scavengers as well as the larger members of the *Synodontis* group. Botias, if they are large, cope well with the water chemistry and the aggression of the cichlids. To reduce aggression in these fishes there are two basic approaches:

USE OF DITHER FISHES:

A school of 6-10 Australian or New Guinea rainbow fish make excellent dither/target fish in an East African aquarium. Rainbow fishes enjoy the same hard alkaline water as the east African cichlids and the fact that they are fast swimmers helps them to get out of a pinch when they are being chased. They also occupy the upper half of the aquarium which adds greatly to the aesthetic value of dither fish. Dither fish seem to distract cichlids from each other and can reduce injuries on other cichlids significantly.



Melanochromis auratus (female). Photo by Vlad Butsky.



Melanochromis auratus (male). Photo by Vlad Butsky.



Electric yellow and Electric Blue cichlids highlight the dynamic colours available in the Lake Malawi cichlid flock.

CONTROLLED OVERCROWDING:

Overcrowding is a extremely effective method of aggression reducing in African cichlids, particularly mbuna. Overcrowding works by not allowing individual fish to establish large territories and therefore becoming hyper dominant. It also spreads the aggression from a dominant individual out amongst a larger number of fish.

PLANTS FOR LAKE MALAWI & LAKE VICTORIA CICHLIDS

It is almost impossible to keep plants with these cichlids, particularly the algal grazing mbuna. Tough plants such as java fern and *Anubias* species may be of some use with *Aulonocara* and other less vegetarian species.



Rainbowfish make great ditherfish for cichlids. In addition, they enjoy the same hard, alkaline water making them ideal choices for companion fishes. Keep in groups of 4+. Photo by Boscosami.



A young male *Pseudotropheus* sp. "Elongatus Mpanga". Photo by Budi Lukman.

Lake Tanganyikan Cichlids

Lake Tanganyika in East Africa hosts a diverse array of cichlids whose behaviour and reproductive strategies are more diverse than the neighbouring lakes of Malawi and Victoria.

COMMONLY AVAILABLE GENERA INCLUDE:

Altolamprologus (eg: *A. calvus*), *Benthochromis* (eg: *B. tricoti*), *Eretmodus* (eg: *E. cyanostictus*) *Julidochromis* (eg: *J. regani*), *Chalinochromis* (eg: *C. brichardi*), *Cyathopharynx* (eg: *C. furcifer*), *Cyphotilapia* (eg: *C. frontosa*), *Cyprichromis* (eg: *C. leptosoma*), *Ectodus* (eg: *E. descampsii*), *Lepidolamprologus* (eg: *L. attenuatus*), *Neolamprologus* (eg: *N. ocellatus*), *Ophthalmotilapia* (eg: *O. boops*), *Paracyprichromis* (eg: *P. nigripinnis*), *Spathodus* (eg: *S. erythrodon*), *Tanganicodus* (eg *T. irsacae*), *Tropheus* (eg: *T. moorii*), *Xenotilapia* (eg: *X. ochrogenys*).

Although Tanganyikan cichlids are similar to the cichlids of Lake Malawi, they differ as follows. Lake Tanganyikan cichlids require higher pH water from 8.0 to 9.5 with higher hardness requirements. They are also, normally, more expensive to the aquarist than the mbuna or *Aulonocara* sp. of Lake Malawi. Since most of these fishes are quite "pricey" it

GENERA	SIZE	AGGRESSION	SEX RATIO	BREEDING METHOD	DIET
<i>Altolamprologus</i>	Small to Medium	less aggressive	1:1	Cave/Shell Spawner	Micropredator
<i>Eretmodus</i>	Dwarf to Small	unaggressive	1:1	Biparental mouthbrooder	Omnivore
<i>Julidochromis</i>	Small to Medium	unaggressive to less aggressive	1:1	Cave spawner	Omnivore Micropredator
<i>Cyathopharnx</i>	Medium to Large	unaggressive to less aggressive	2:5	Pit spawner	Omnivore Supplement with vegetable material
<i>Cyphotilapia</i>	Large	less aggressive	1:3	Maternal mouthbrooder	Omnivore Opportunistic piscivore
<i>Cyprichromis</i>	Small to Medium	unaggressive	2:5	Maternal mouthbrooder	Omnivore
<i>Ectodus</i>	Small to Medium	unaggressive	1:3	Maternal mouthbrooder	Maternal mouthbrooder
<i>Leipidolamprologus</i>	Medium to Large	aggressive to very aggressive	1:1	Cave spawner	Specialised predator
<i>Neolamprologus</i>	Dwarf to Medium	less aggressive to very aggressive	Species specific	Species specific	Micropredator Omnivore.
<i>Ophthalmotilapia</i>	Small to Medium	unaggressive	1:3	Maternal mouthbrooder	Omnivore
<i>Paracyprichromis</i>	Small to Medium	shy to unaggressive	2:5	Maternal mouthbrooder	Omnivore
<i>Spathodus</i>	Dwarf to Small	shy to unaggressive	1:1	Biparental mouthbrooder	Omnivore
<i>Tanganicus</i>	Dwarf to Small	shy to unaggressive	1:1	Biparental mouthbrooder	Omnivore
<i>Tropheus</i>	Medium	aggressive to very aggressive	Species specific	Maternal mouthbrooder	Algal Grazer
<i>Xenotilapia</i>	Small to Medium	less aggressive	1:1	Biparental mouthbrooder	Omnivore

follows that many are more difficult to keep healthy or breed more slowly. For these reasons it is recommended that they be kept separately to Lake Malawi cichlids. Body form also tends to differ more in Lake Tanganyikan cichlids than in the fishes of Lake Malawi.

Personally I have seen tanks that mix full size frontosa (around 30cm) with breeding colonies of *Neolamprologus brichardi* and the tiny shell dwelling *Neolamprologus multifasciatus* (round 3cms), this should only be done however in a very large aquarium with ample hiding spaces for the smaller fishes. The results in these tanks are spectacular, like a slice of life in Lake Tanganjika.

Dither fish work with the Lake Tanganyikan cichlids as described above for the other African lake cichlids. Lake Tanganyikan cichlids are relatively tolerant of plants with the exception of the algal grazing species such as *Tropheus* spp. Many plants however do not tolerate the hard, alkaline water well. Best choices are *Anubias* spp. Java fern and Java Moss.



One of the most iconic Tanganyikan cichlids are from the genus *Tropheus*. These compact-bodied, aggressive, vegetarian cichlids have a reputation for being challenging to keep. They are quite aggressive and should be kept in large groups in species tanks to assist to spread the heckling amongst the largest number of individuals possible. If you're interested in keeping *Tropheus* seek out a n aquarium that specialises in cichlids or hobbyists who have a passion for this group.



Lamprologus stappersi



Julidochromis regani 'Zambia Gold'



Lepidiolamprologus nkambae. Photo by Mario Rubio García.



Cyprichromis leptosoma 'Mpulungu'. Photo by Dr. Jessica Drake



Julidochromis ornatus 'Gold' . Photo by Dr. Jessica Drake.



Chalinochromis ndobnai. Photo by Dr. Jessica Drake.



Cyprichromis leptosoma 'Kitumba'. Photo by Dr. Jessica Drake



A colony of *Neolamprologus multifasciatus*. Note the fry and the different sized individuals within the group.

LAMPROLOGINE BREEDING HABITS

GENERA	SPECIES	FAMILY STRUCTURE	DECOR
Type I: Cave Spawners	eg: <i>N. caudopunctatus</i> , <i>N. cylindricus</i> , <i>N. lelupi</i> , <i>N. mustax</i> and similar species.	Monogamous	Terracotta pots and saucers are useful.
Type II: Step breeders (Cave Spawning)	eg: <i>N. brichardi</i> complex	Monogamous	Terracotta pots and saucers are useful.
Type III: Shell dwellers	eg: <i>N. brevis</i> , <i>N. multifasciatus</i> , <i>N. ocellatus</i> , <i>N. speciosis</i>	Polygamous 1:3	Mollusc shells.

West African Cichlids

COMMONLY AVAILABLE SPECIES INCLUDE

Anomalochromis sp. (Thomasi cichlids), *Hemichromis* sp. (eg: Jewel Cichlids), *Steatocranus* sp. (eg: Lion or Buffalohead cichlids), *Pelvicachromis* sp. (eg. Kribensis) and *Tilapia* (eg: *T. buttikoferi*).

Only a relatively small range of West African cichlids are available to the cichlid keeping hobby, particularly in Australia where the import of most West African cichlids is prohibited. These fishes thrive in moderately soft water which is neutral to slightly acidic in pH. Commonly available West African Dwarf cichlids such as *Nanochromis* sp. *Anomalochromis thomasi* and *Pelvicachromis* sp. are the most commonly encountered fish in the group and are the best group for newcomers to these fish. The Hemichromines and *Tilapia* sp. require larger tanks and more resilient companion fish than the aforementioned West African dwarf cichlids. Fishes such as the lionhead (*Steatocranus casuarius*) require very high levels of oxygen as they come from the rapids of Zaire rivers, be sure to include a power head in tanks with *Steatocranus* sp. There are at least six species of Hemichromines available in Australia.

COMPANION FISH FOR WEST AFRICAN CICHLIDS

Useful dither fish include the larger barbs - rosy, tiger barbs and the like and or Australian Rainbow fish. Useful scavengers are the smaller locarid catfishes e.g. bristlenose catfish, twig catfish or whiptail catfish.



Pelvicachromis deserve much more popularity. There's few cichlids that rival these pint-sized, peaceful fish in terms of colour.
An underrated West African gem! Pictured: *P. pulcher* (female)

PLANTS FOR WEST AFRICAN CICHLIDS

Unlike their East African cousins who dwell in Lakes most West African cichlids hail from rivers, streams and ponds, environments not short of plant life. It's not surprising therefore that these fish like a well planted tank.

Again use tougher plants such as Java fern and *Anubias* sp. Use rock and wood to create numerous caves and hiding places as these fish are quite non aggressive. Most species of west african cichlids are quite tolerant of plants although some Tilapia species do dig.



a female *Pelvicachromis taeniatus* 'Nigerian Red'



For reasons that aren't clear, like *Pelvicachromis* sp., Jewel cichlids from the genus *Hemichromis* aren't nearly as popular as their colours suggest they should be. They are aggressive when breeding, but not notably more than East African cichlids - so this lack of take up by hobbyists is pretty suprising.



Steatocranus tinanti isn't going to win any beauty contests, but what it lacks in colour it makes up for in personality. An excellent fish for advanced cichlid aquarist.



A young pair of the rapids-dwelling *Steatocranus casuarinus* (the Lionhead, Blockhead, Buffalohead cichlid). The female (in pot) is smaller and has a less developed head hump.

GENERA	SIZE	AGGRESSION	SEX RATIO	BREEDING STYLE	DIET
<i>Anomalochromis</i>	Small	unaggressive	1:1	Substrate spawner	Unfussy omnivore
<i>Hemichromis</i>	Small to Medium	aggressive to very aggressive	1:1	Substrate spawner	Omnivore Micropredator
<i>Pelvicachromis</i>	Small	unaggressive	1:1 - 1:2	Cave spawner	Unfussy omnivore
<i>Steatocranus</i>	Small to Medium	unaggressive to less aggressive	1:1	Cave spawner	Omnivore Micropredator
<i>Tilapia</i>	Small to Large	unaggressive to very aggressive	Species specific	Species specific	Species specific Mainly omnivores



The beautiful *Anomalochromis thomasi*. Photo by Budi Lukman.

CLOSE

Cichlids are amazing fish. Their brood care is unrivalled in the fish keeping hobby and their fascinating, beautiful animals. While many species are indeed aggressive, this aggression can be managed provided suitable husbandry is adopted. If you're interested in cichlids, or we've inspired you to have a look at these fish again, find yourself a store that specialises in cichlids (or at least has several dedicated cichlid aquaria). Good advice is key to not having a bad experience with these fishes, get the setup and stocking right and you'll be rewarded.



Some *Tilapia* species are illegal in some jurisdictions as they've become a pest species in local rivers. Check with local authorities before purchasing this members of this genus.

Today In The Fishroom

with Mo Devlin

GEORGIA AQUARIUM!



Atlanta, Georgia

Text by Mo Devlin. All photos, unless otherwise stated, are by Mo Devlin.

I have a bucket list of future photos. Right at the top of that list...is...was...photographing some of the largest fish in the world. I got that opportunity during a recent visit to Atlanta, Georgia. The Georgia Aquarium in downtown Atlanta is the largest in the world, with more than 8.5 million U.S. gallons of water and housing 120,000 animals in 500 different species.

The aquarium has the unique distinction of housing two of the world's largest fish, the giant whale shark. At one point they had a total of four. Due to some health issues, they lost two and now have two babies, both the size of a large sedan. The original four fish arrived from Taiwan and were named after the old "Honeymooner's" TV Show: Ralph, Norton, Alice and Trixie.



The front of the Georgia Aquarium. Photo by Rian Castillo.

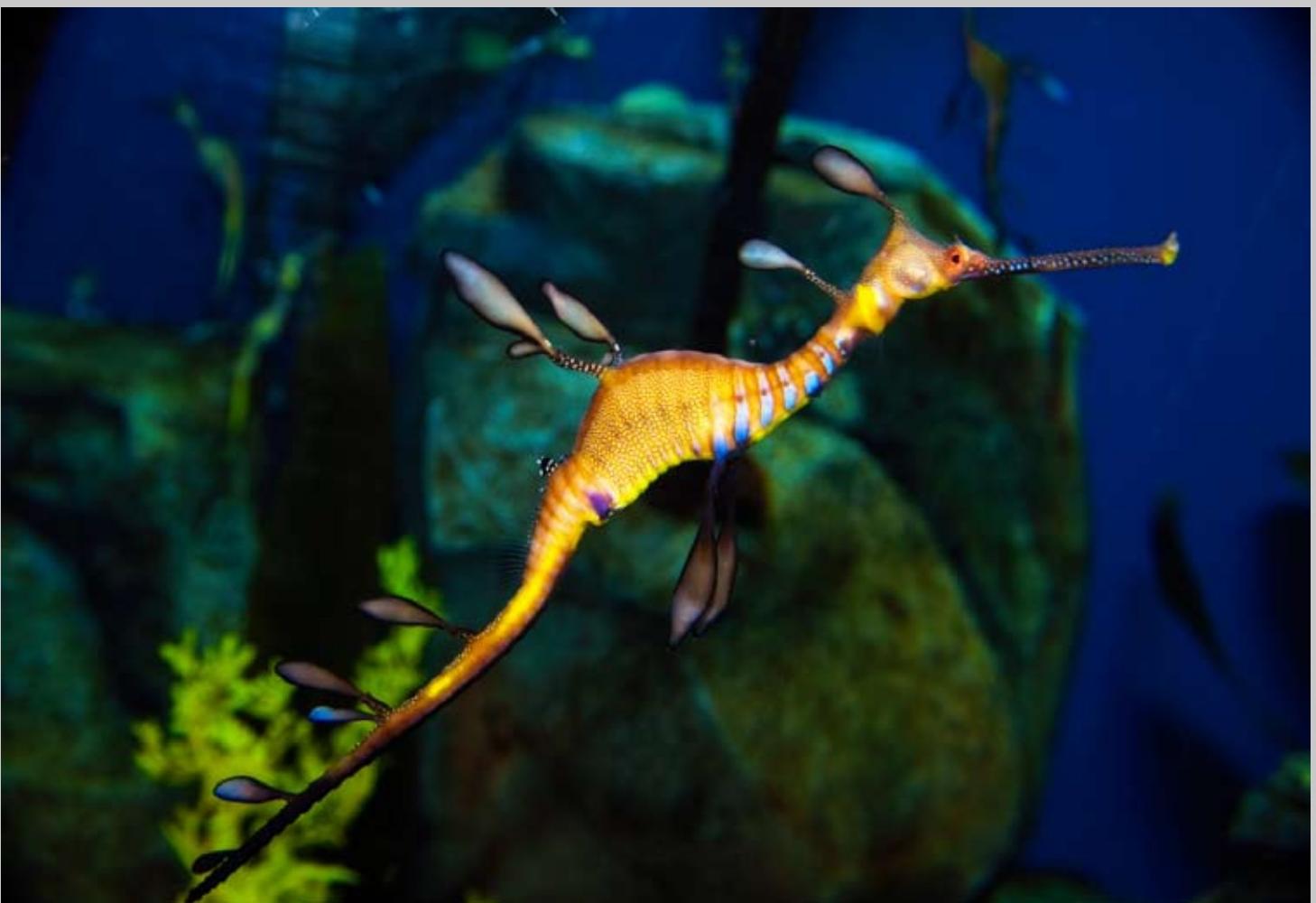


The world's largest fish, the Whale Shark.

Outside of Asia, the Georgia Aquarium is the only institution to house this fish.

As I turned the corner into the Ocean Voyager viewing window, I had to stop to catch my breath. It is quite simply, amazing. The second largest viewing window in the world, it's 27 feet high, 63 feet wide and weighs 120 tons. The acrylic that separated me from 6.5 million gallons of water and thousands of fish was two feet thick. But the effect was as if you were right on the sea bottom and could reach out and touch the fish.

Built in November 2005, the aquarium was funded mostly by



The Weedy Seadragon is native to Australia's southern coastline.



....the acrylic that separated me from 6.5 million gallons of water and thousands of fish was two feet thick...





Cleaner Wrasse cleaning gills.

the co-founder of Home Depot, Bernard Marcus. The aquarium itself was constructed to be very user friendly, providing windows and ports along the way all at kid height to encourage viewing and quiet reflection on the beautiful sea life scenery. The entrance into the Ocean Voyager's theater is through a large tunnel. This also provided me with a unique opportunity for photos. Where else could you be at the bottom of the sea photographing sea life above?

As we walked through the tunnel I was treated to a very unique example of the symbiotic relationship between sea life. Pressed very close to the bottom of the glass window was a giant grouper. I watched in amazement as two tiny Wrasses went about the task of cleaning the gill rakers of this monster sized fish.

One other exhibit that proved very interesting at the aquarium, "Frogs - a Chorus of Colors", featured a look at fifteen different species of frogs. The exhibit itself is touted as the most advanced traveling frog show in the U.S.A. Featuring everything from the beautifully colored Poison Dart Frogs to the enormous African bull frog. Although not my cup of tea so to speak, they did offer interesting subject matter for some colorful photos.

All in all it was a wonderful experience. So much sea life and so many opportunities to capture images. I encourage anyone with the opportunity to see the aquarium, to go. Bring your camera and bring a small cushion. Once you enter the Ocean Voyager theater, you will be there for a long time. Cross one off the bucket list.



Maintenance - giant aquarium style (top), mesmerising jellies (mid) float in the water column and below - an enormous, but amazingly coloured African Bull Frog.



ABOUT THE AUTHOR



Mo Devlin is the owner of Aquamojo.Com. He maintains three thousand gallons of fresh water tanks. Over his thirty years in the hobby he has successfully bred many of the Central and South American cichlid fishes. His passion for New World cichlids is only rivaled by his love of photography. Over the years, he has posted images of his collection frequently in his "Today in the Fishroom" series on line across many national and international fish forums. Mo has spent two terms on the board of trustees for the American Cichlid Assn, was chairman of the organization in 2010, and has been the Publicity chairman for the past decade.

FIRST TIME AT SEA

a reefkeeping journal

It's the 6 month mark and this month has seen some interesting changes to the aquarium. I've added some new beautiful corals from Cairns Marine to the aquarium, coralline algae is beginning to grow on the glass and stone now in impressive amounts. The corals and fish are doing well. This month I'll give you a look at the new lights, what I'm feeding and some beautiful new additions.

As most of you will know the AquaReef 350 setup ships with quad T5 lights -- which have been great -- and this month I'm augmenting their output by adding some new LED lights to the aquarium. For this I've chosen the AquaBeam 600 Ultra Fiji from AquaRay. The combo pack I've added contains two lights, a Fiji Blue and a Reef Blue. The lights themselves are very slim and light (as shown right). To get an idea of their output I turned them on in my living room. Now I knew at the time they were different colours - but to your eye looking at the Fiji Blue and the Reef Blue LEDs they appear almost identical. It's obviously a limitation in human vision and both my photos of the lights and the lighting on the aquarium itself demonstrates that they are indeed very different colours (see the photo on page 32).



a beautiful peach coloured *Trachyphyllia geoffroyi* from the folks at Cairns Marine.



Augmenting the quad T5 lighting that comes shipped with the AquaReef 350, I've added two LED strips from AquaRay.

AquaReef – The Ultimate **MARINE** Aquarium

- Inbuilt sump filtration system
- The specially designed cabinets with no back panel offer ample ventilation to reduce heat and humidity build-up
- A chiller can be added to the system without the need for extra pumps
- Highest quality 'white' glass to fronts on the 300 & 400 models, all 3 sides on the 275 cube ensure optimum clarity
- Cabinet comes built and is exclusively manufactured from alloy frame and plastics to ensure maximum resistance to salt and moisture damage normally associated with marine aquariums
- All models fitted with Aqua One's patented 'Quadrolite' T5 lighting system with reflector panels to increase light output and 4 x T5 tubes to provide a balanced, visually pleasing spectrum
- Combines wet/dry filtration with a venturi style protein skimmer with needle wheel pump to ensure excellent water quality
- Has a flexible duckbill outlet to return water back to the aquarium



MODEL	VOLUME	DIMENSIONS
AquaReef 300	300L	102 L x 52 D x 73/88 cm H
AquaReef 400	400L	132 L x 52 D x 73/88 cm H
AquaReef 275	275L	70 L x 70 D x 77/79 cm H

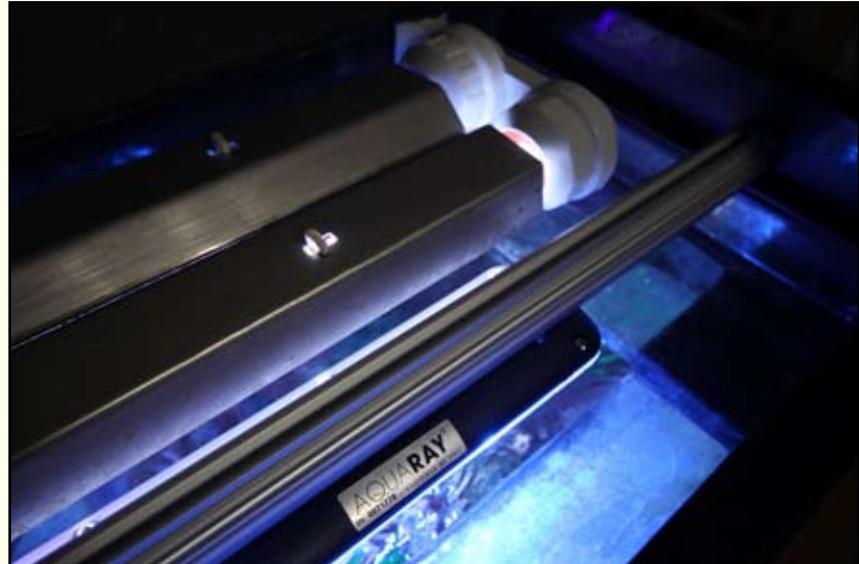
Aqua One products are widely available at most quality pet retailers. To find your nearest retailer, visit www.aquaone.com.au

Installation is refreshingly simple, I cut the aluminium rails from AquaRay to the correct length using a hack saw, after measuring the span across the top of the aquarium. On the AquaReef350 there's a fantastic lip to mount the rails on already available inside the hood. Once I cut the rails to size, I slide the LED strips onto the rails and placed it adjacent to the T5 lights. Easy.



To the naked eye, these two LED strips look very similar in colour, but the cameras sensor shows the Fiji Blue (top) and the Reef Blue (bottom).

The effect is pretty striking, the T5 lights (which are 2x white and 2x actinic) tend to give everything the aquarium a bit of a yellowish red colour. Turning on the LEDs in addition to the T5 makes for a whole new visual experience. Greens are greener, reds are redder, blues are bluer. It's very pretty and without wholesale changes the hood is also pretty convenient.



Inside the hood of the AquaReef 350 there's a lip that's perfect for adding the AquaRay LED lights. Installation is simple, cut the aluminium rails to length and install next to the pre-installed T5 lights. So easy, even I can do it!

LED lighting has made for a bit of a revolution in marine reef systems. It's low cost compared to metal halides and has made the marine keeping hobby more accessible to more people. With LED lights (or metal halides for that matter) there's an initial outlay of money to get it setup, however, the benefits of LED over metal halides are numerous. They include lower wattage -- these AquaRay lights are only 12 watts -- and they put out a considerable amount of light output and relatively little heat. They're also great for the environment as their long lasting, more than 50,000 hours bulb life, they are made using a small carbon footprint and they (unlike metal halide lamps) are free of toxic metals like mercury. Having installed these on my AquaReef 350, I honestly can't imagine the system without the extra colour and water shimmer they provide. I'll report any changes in coral performance over the coming months.



T5 lighting only...



and the T5 lights in combination with the new AquaBeam600 Ultra Fiji Combo pack. The difference in the intensity of the greens, reds and blue colours in this aquarium is, being totally frank, astounding.

In terms of feeding, I've been using New Era Foods. New Era's a relative newcomer to the fish food area - but they are making a bit of a splash with a range of their products. They make a range of pellets, flake and grazing discs. For my system, with just three fish, the grazing discs are too much food -- but I can, and have, used them temporarily and the Kole Tang emerges

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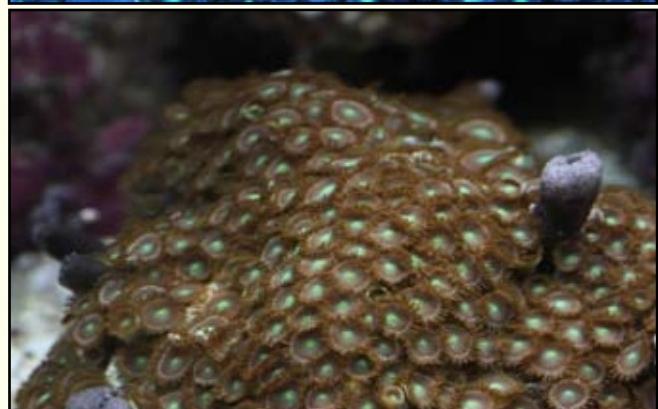
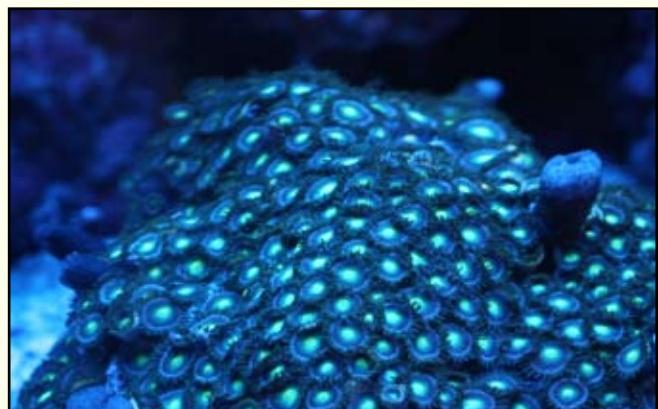
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from his hiding place amongst the rocks to browse on the discs. Both the Tang and clowns eat the pellets, which are the sinking variety. The soft pellets are good for feeding some of my Fungia and some of the small anemones in the aquarium -- most of these anemones are Fire Anemones (*Actinodendron plumosum*) I probably shouldn't be feeding them - but thus far they seem harmless enough and I rather like their feathery tentacles.

In terms of new stock, the staff at Cairns Marine have supplied me with some lovely corals. Including a beautiful peach coloured *Trachyphyllia geoffroyi* (photo on page 29, an amazingly green *Goniastrea*, stunning *Gonipora*, a bicoloured *Lobophyllia*, a green and pink *Plesiastrea versipora*, a beautifully patterned *Micromussa amakusensis*, some lovely green domed mushrooms (*Cycloseris cyclolites*) and a number of others I'll feature over the coming



The items from the New Era range that I've been feeding my fish and corals. The grazing discs attach to a suction cup which is a clever feature of this food. Ideal for tangs and similar.



A really beautiful green *Goniastrea* from Cairns Marine!

Zoanthids under AquaRay LEDs only (top), quad T5s only (middle) and with both LEDs and quad T5s (Bottom).

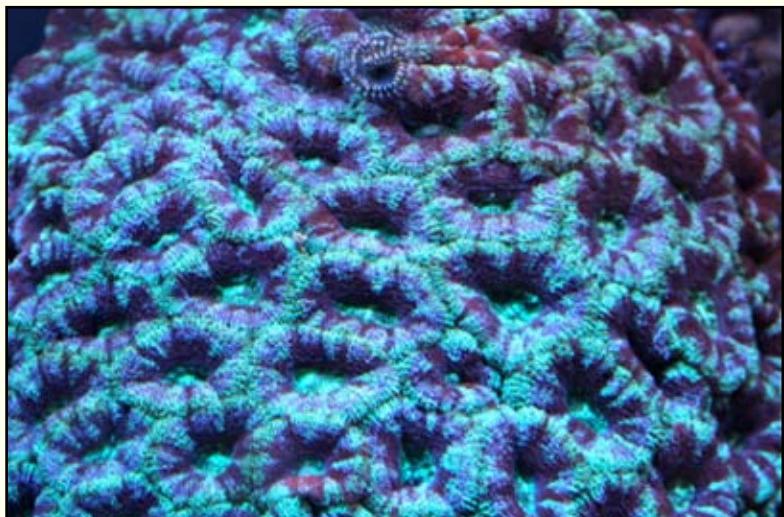
ABOUT THE AUTHOR

David Midgley

When he's not editing Redfish Magazine, David Midgley is a scientist who has a PhD in Microbial Ecology and works with microbes in the subsurface. He lives in Sydney, Australia with his wife, kids, cats and now - Reef Aquarium.



Toxic green domed mushrooms add an amazing splash of colour to the substrate (top), a Gonipora waves its polyps in the current (middle) while below a beautifully patterned *Merulina ampliata* glows lime green under the LED lighting.

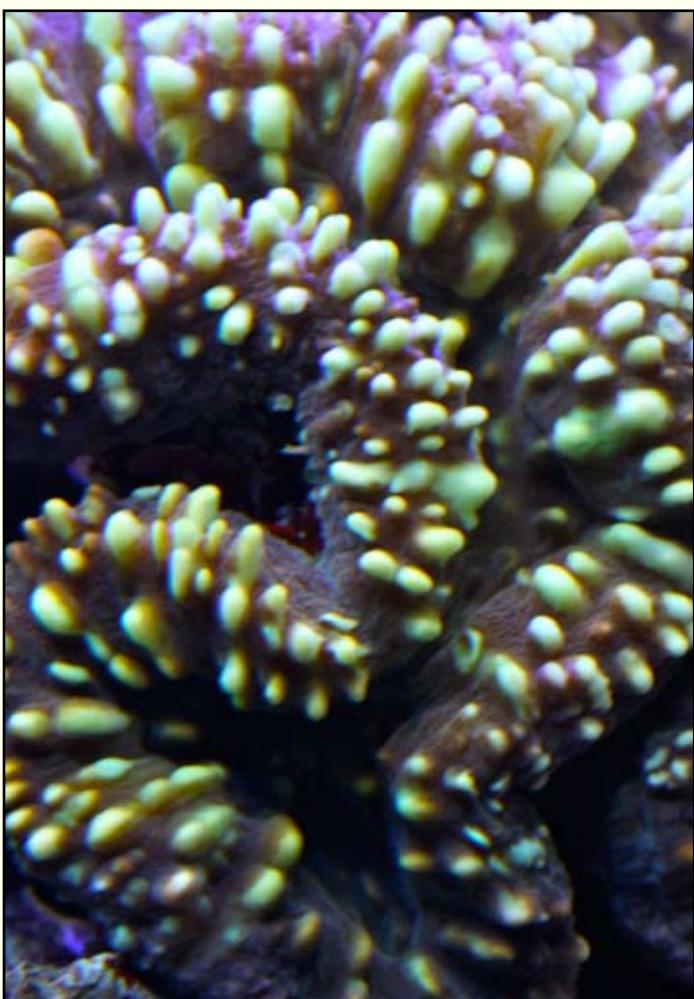


There's a striking pattern to this *Micro-mussa amakusensis* (top), a filter feeding worm is visible at the top of the photo. The bicoloured *Lobophyllia* (bottom) makes for a striking contrast in the aquarium. It's being photobombed by my fast-growing *Xenia*, visible at the base of the photo!

With so many bright colours and shapes, it's pretty difficult to pick a favourite!

I've been in touch with my local aquarium store who have been giving me some advice on positioning of corals. Next month, I'll focus in on this topic - discuss a water top-up system I'll be installing and give everyone an update of where the tank is at. Until then - thanks for reading!

David, November 2012.



Last month I made an error, the urchins (top-right) I identified as *Tripneustes* are actually *Mespilia globulus*. Thanks to Aaron Sewell for the correction. More lovely corals from Cairns Marine: *Lobophyllia pachysepta* (right), a beautiful green *Trachyphyllia* (top-left) and *Blastomussa wellsi* (bottom-left).



photo by Khantipol

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GOLDSADDLE GOATFISH



Name: Goldsaddle Goatfish (*Parupeneus cyclostomus*)

Family: Mullidate

Distribution: Occurs in most tropical reef-associated oceans, the tropical Atlantic aside.

Size: This is a large growing species reaching almost 50cm (20"). It follows therefore that it is best suited for specialists with very large aquariums. It is, however, frequently sold as a juvenile and prior to purchase, it's important to know about the requirements for the species.

In the wild: Like most goatfish, the species spends most of its time in close to the seafloor, using its barbels to probe the rubble, sand and holes in rocks for prey items. Prey is variable but can include small fishes, crabs, worms, octopi, shrimps and molluscs. Juvenile Goldsaddle Goatfish are social animals, forming schools while the adult fish is typically solitary.

In the aquarium: Keeping the Goldsaddle Goatfish is challenging. Its size alone dictates that it is really only suitable for aquarists with very large aquariums (>500 litres, 130 gallons). Their invert eating habits dictate they are fish for a fish-only style of aquarium. The species are well-known jumpers so tight-fitting (potentially thick) glass lids are a must. Goatfish aren't aggressive per se, they are, however, carnivores and will consume small fishes that can fit in their mouths. This dictates that suitable tankmates be 1. non-territorial (though goatfish are agile and rapid swimmers and can usually get themselves out of harms way) and 2. also large sized. Think large Angelfish and the like. Feeding is straightforward for the Goldsaddle Goatfish, and like its namesake the goat, the species will consume most any kind of foods. Diligent goatfish owners should be sure to provide a varied diet that resembles the natural prey items the fish consumes.

The aquarium filtration for goatfish is not overly different to that which one should provide for other large fish eating meaty (and messy foods). High circulation/turnover is more important as the goatfish create a degree of additional mess when turning over the substrate.

Close: If you're wanting to try something different, have some experience under your belt with other large marine species and their husbandry then this goatfish is a great choice. If you're wandering through your local aquarium and wondering if you should add that cute little yellow goatfish to your reef tank - think again.



Goldsaddle goatfish are large, unusual and somewhat challenging species for the fish-only marine aquarium. Unless you're an expert, admire from a distance.

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Salty Tank

American Livebearer Association

USA Fish Box

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<http://www.saltytank.com>
<http://livebearers.org/>
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Alberta

Calgary Aquarium Society
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Brampton Aquarium Club
Peel Aquarium Club
Brant Aquarium Society
Chatham-Kent Aquarium Society
St Catharines & Area Aquarium Soc.
Durham Region Aquarium Society
Ottawa Valley Aquarium Society
Hamilton & District Aquarium Society
Forest City Pond Club
Kitchener/Waterloo Aquarium Society
London Aquarium Society
Sarnia Aquarium Society
Toronto Willowdale Aquarium Society

<http://www.bettabreederscanada.com/>

<http://www.calgaryaquariumsociety.com/>
<http://www.fish-club.org/>

<http://vahs.ca/>
<http://wetcoastaquariumsociety.ca/wetcoast/>

<http://www.bac-on.org/>
<http://www.peelaquariumclub.org/>
<http://www.brantaquariumsociety.ca/>
<http://www.cichlidae.com/forum/viewforum.php?f=103>
<http://www.scaas.info/index.html>
<http://www.dras.ca/>
<http://ovas.ca/>
<http://www3.sympatico.ca/ps.mcfarlane/home.htm>
<http://www.freewebs.com/fcpc/>
<http://www.kwas.ca/>
<http://www.londonaquariasociety.com/>
<http://www.geocities.com/sarniaaquariumsociety/>
<http://www.torontoaquarium.org/>

Manitoba

Aquarium Society of Winnipeg

Nova Scotia

East Coast Aquarium Society

Saskatchewan

Saskatoon Aquarium Society
Regina Aquarium Society

<http://www.asw.ca/>

<http://www.eastcoastaquariumsociety.ca/forum/>

<http://www.saskatoonaquarium.com/>
<http://www.reginaaquariumsociety.ca/>

Quebec

Montreal Aquarium Society
La Societe des Aquariophilie de Montreal
Ass. Reg. des Aquariophiles de Quebec

<http://www.geocities.com/mtlfishclub/index.html>
<http://www.aquasam.qc.ca/>
<http://www.oricom.ca/pierdes/>

UNITED STATES OF AMERICA

Alaska

Juneau Aquarium Society

Arizona

Dry Wash Aquarium Society

California

Bakersfield Koi & Water garden Society
Desert Fish Club
Sacramento Aquarium Society
San Francisco Aquarium Society
Silicon Valley Aquarium Society
Santa Clara Valley Koi and Water Garden Club
San Diego Tropical Fish Society
Pacific Coast Cichlid Association

<http://www.taursys.com/kasha/JAS/>

<http://www.drywashaquarium.org/>

<http://www.bakersfieldkoidclub.com/>
<http://www.desertfishclub.com>
<http://www.sacramentoaquariumsociety.org/>
<http://www.sfaquarium.org/>
<http://www.tactics.com/d/svas/>
<http://www.sckoi.com/>
<http://www.geocities.com/sandiegofishfan/>
<http://www.cichlidworld.com/>

Colorado

Southern Colorado Aquarium Society
Colorado Aquarium Society
Rocky Mountain Cichlid Association

<http://www.southerncoloradoaquariumsociety.com/>
<http://www.coloradoaquarium.org>
<http://www.liss.olm.net/rmca/>

Connecticut

Aqua-Land Aquatic Society
Exotic Fish Society of Hartford Inc.
Norwalk Aquarium Society

<http://pages.cthome.net/vito/>
<http://users.rcn.com/wmercer/>
<http://www.castaways56.supanet.com/>

Florida

Gold Coast Aquarium Society South Florida
Tampa Bay Aquarium Society

<http://www.gcassf.org/Home.htm>
<http://www.tbas1.com/>

Georgia

Atlanta Area Aquarium Society
Hawaii

<http://atlantaaquarium.com/>
<http://www.geocities.com/Heartland/Meadows/2948/HASF.html>

Illinois

Champaign Area Fish Exchange
Chicagoland Marine Aquarium Society
Planted Aquarium Club of Chicago
Tri-County Tropical Fish Society
Greater Chicago Cichlid Association
Rockford Reefers Aquarium Club

Indiana

Circle City Aquarium Club, Inc.
Indiana Marine Aquarium Society
Michiana Aquarium Society

Iowa

Eastern Iowa Aquarium Association
Iowa Aquarium Society
Greater Iowa Reef Society

Kentucky

Greater Louisville Koi & Goldfish Society
Louisville Marine Aquarium Society

Maine

Great Lakes Aquarium Society
Wochester Aquarium Society

Massachusetts

Boston Aquarium Society
Pioneer Valley Aquarium Society
Worcester Aquarium Society

Michigan

The Aquarium Society of Ann Arbor
Grand Valley Aquarium Club
Southwestern Michigan Aquarium Society
Motor City Aquarium Society
Greater Detroit Aquarium Society
Metro Detroit Aquarium Clubs
Upp. Peninsula of Michigan Marine Aq. Soc.
Marinelife Aquarium Society of Michigan

Minnesota

Minnesota Aquarium Society
Red River Valley Aquarium Club

Missouri

Missouri Aquarium Society
Heart of America Aquarium Society

New Hampshire

New Hampshire Aquarium Society

New Jersey

Jersey Shore Aquarium Society
North Jersey Aquarium Society

New York

Greater City Aquarium Society
Brooklyn Aquarium Society
Allegheny River Valley Aquarium Society
Long Island Aquarium Society
Central New York Aquarium Society
Nassau County Aquarium Society
Danbury Area Aquarium Society
Tropical Fish Club of Erie County

North Carolina

Raleigh Aquarium Society
Cape Fear Aquarium Society

Ohio

Stark County Aqua Life Enthusiasts
Greater Cincinnati Aquarium Society
Cleveland Aquarium Society
Ohio Cichlid Association
Greater Akron Aquarium Society
Medina County Aquarium Society
Youngstown Area Tropical Fish Society
Ashtabula County Aquarium Club
Lorain County Aquarium Society
Columbus Area Fish Enthusiasts

Oklahoma

Oklahoma Aquarium Association

<http://www.champaignfish.com/>
<http://www.cmas.net/>
<http://www.pacchicago.org/>
<http://aquariumhobbyist.com/tctfs/index.html>
<http://www.gcca.net>
<http://www.rockfordreefersaquariumclub.org/>

<http://www.circlecityaqclub.org>
<http://indmas.org>
<http://michianaaquariumsociety.org/>

<http://www.eiaainfo.org/>
<http://www.iowaaquaria.com/>
<http://www.greaterioreefsociety.org/>

<http://www.louisvillekoiclub.com/>
<http://www.lmas.org/joomla/>

<http://www.glaquarium.org/>
<http://www.petsforum.com/was/>

<http://www.bostonaquariumsociety.org/>
<http://www.pvas.net/html/>
<http://www.petsforum.com/was/>

<http://sitemaker.umich.edu/aquarium.society>
<http://www.grandvalleyaquariumclub.org>
<http://www.swmas.org/>
<http://home.att.net/%7ec.r.newell/clubs/page2.html>
<http://www.greaterdetroitaquariumsociety.com/>
<http://home.att.net/~c.r.newell/clubs/>
<http://www.upmmas.com/>
<http://www.masn.org/>

<http://www.mn-aquarium.org/>
<http://www.geocities.com/fmaquarium/>

<http://www.MissouriAquariumSociety.com>
<http://www.kcfishclub.org/>

<http://www.nhaquariumsociety.com/index.htm>

<http://www.jerseyshoreas.org/>
<http://www.njas.net/>

<http://ourworld.compuserve.com/homepages/greatercity/>
<http://www.basny.org/>
<http://www.orgsites.com/ny/arvas>
<http://www.liasonline.org>
<http://www.cnyas.org/>
<http://www.ncasweb.org>
<http://northeastcouncil.org/daas/index.html>
<http://tfcec.tripod.com/tfcecwebsite/>

<http://www.fishclubs.com/nc/ras/main.html>
<http://capefearaquariumsociety.com/>

<http://www.scalesclub.com/>
<http://www.gcas.org/>
<http://www.clevelandaquariumsociety.org>
<http://www.ohiocichlid.com/>
<http://www.gaas-fish.net>
<http://www.geocities.com/MCASfish/>
<http://www.yatfs.com/>
<http://www.geocities.com/Heartland/Park/6982/index.html>
<http://geocities.com/RainForest/Andes/3049/>
<http://www.columbusfishclub.org/>

<http://petsforum.com/okcaa/>

Oregon

Greater Portland Aquarium Society

Pennsylvania

Bucks County Aquarium Society

Pennsylvania (cont)

Delaware County Aquarium Society

International Betta Congress

Aquarium Club of Lancaster County

Northeast Philadelphia Aquarium Society

Greater Pittsburgh Aquarium Society, Inc.

Pittsburgh Marine Aquarium Society

Erie Aquarium Society

Rhode Island

Tropical Fish Society of Rhode Island

South Carolina

Myrtle Beach Aquarium Club

Tennessee

Putnam County Aquaiurm Society

West Tennessee Marine & Reef Aquarium Club

Texas

Federation of Texas Aquarium Societies

Capital Aquarium Society of Texas

Dallas/Ft. Worth Aquatic Plant Club

North Texas Water Garden Society

Utah

Great Salt Lake Aquarium Society

Wasatch Marine Aquarium Society

Vermont

Black River Aquarium Society

Virginia

Potamac Valley Aquarium Society

Washington

Bellingham Aquarium Society

Greater Seattle Aquarium Society

Kitsap Aquarium Society

Washington Koi and Water Garden Society

Wisconsin

Milwaukee Aquarium Society

Green Bay Aquarium Society

Central Wisconsin Aquarium Society

<http://www.gpas.org/>

<http://www.bcasonline.com/>

<http://www.dcas.us>

<http://lcbettas.com/>

<http://www.adlc.us/>

<http://www.phillyfishclub.com/>

<http://www.gpasi.org>

<http://www.pmasi.org/frm/>

<http://groups.yahoo.com/group/ErieAquariumSociety/>

<http://www.tfsri.org/>

<http://www.facebook.com/pages/Myrtle-Beach-Aquarium-Club/402263799688>

<http://www.pcaquarium.org>

<http://www.wtmrac.com/>

<http://www.fotaswebsite.org/>

<http://www.petsforum.com/cas/>

<http://www.aquatic-plants.org/>

<http://www.ntwgs.org/>

<http://fancyguppy.50megs.com/custom2.html>

<http://www.utahreefs.com/>

<http://www.angelfire.com/vt/brasvt/>

<http://www.pvas.com/pvasindex.htm>

<http://www.facebook.com/pages/Bellingham-Aquarium-Society/112557868810416>

<http://www.gsas.org/>

<http://www.geocities.com/Petsburgh/5640/kastoc.htm>

<http://www.washingtonkoi.org/>

<http://fishclubs.com/WI/MAS/>

<http://www.gbasonline.org/gbashome.htm>

<http://www.cwas.org/>

PUERTO RICO

Asoci. de Acuaristas de Aguadilla

Acuarista Metro Este

<http://coqui.metro.inter.edu/acuaristas/aaa.html>

<http://www.amepr.org/>

BERMUDA

Bermuda Fry-Angle Aquarium Society

<http://www.fryangle.com/>

BRAZIL

Aquaflux Aquarismo e Aquapaisagismo

Aqualinea

<http://www.aquaflux.com.br>

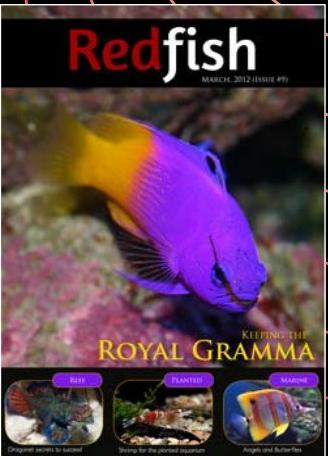
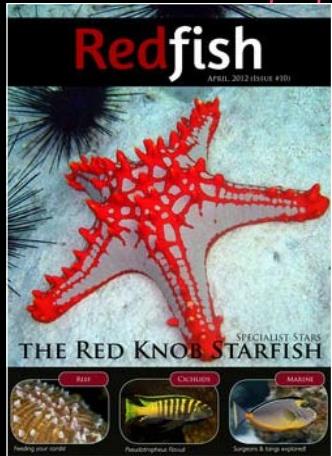
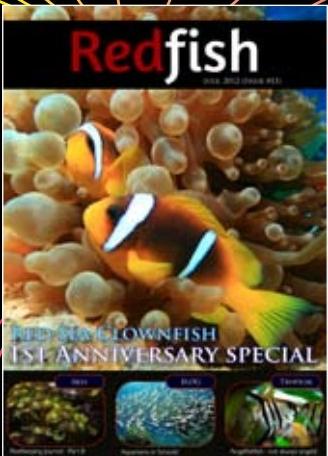
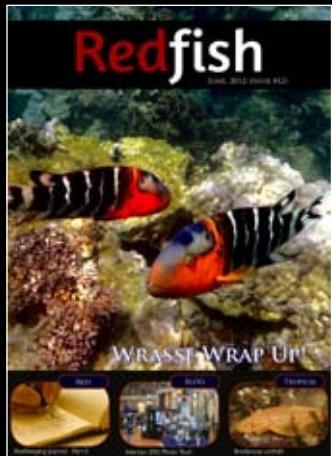
<http://aqualinea.com.br/blog/>



Photo by Hobvias Sudoneighm

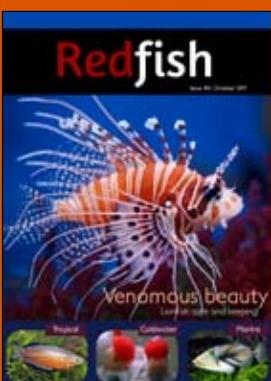
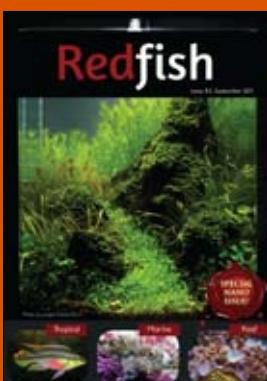
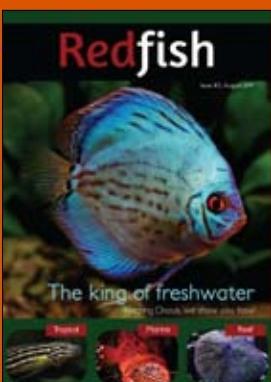
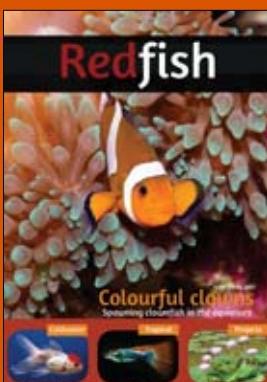
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CONTACT DETAILS

email: enquiries@redfishmagazine.com.au

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